



# IOWA DEPARTMENT OF NATURAL RESOURCES

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LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

Area Source Boiler NESHAP and Major Source Boiler MACT

Iowa Strategic Goals Program

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# Presentation Overview

- Background of Recent EPA Air Toxics Rules for Boilers
- Area Source Boiler NESHAP
  - Applicability and exemptions
  - Subcategories and requirements
  - Reports and notifications
- Major Source Boiler and Process Heater MACT
  - Applicability and exemptions
  - Subcategories and requirements
  - Reports and notifications

# Background

- National Emission Standard for Hazardous Air Pollutants (NESHAP) for Area Sources: Industrial, Commercial, and Institutional Boilers, 40 CFR Part 63 Subpart JJJJJ (6J)
  - Final Rule published March 21, 2011
  - Final Rule amendments published February 1, 2013
- NESHAP for Major Source Industrial, Commercial, Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart DDDDD (5D)
  - Final Rule published March 21, 2011
  - Final Rule amendments published January 31, 2013

# Area Source or Major Source?

- Area sources:
  - Small stationary sources of air toxics
  - Any source that emits some hazardous air pollutant (HAP) but is not a major source of HAP
  - Potential to emit less than 10 tons per year (tpy) for a single HAP and less than 25 tpy for combined HAP
  - Area sources of HAP may or may not be subject to Title V permitting
- Major sources:
  - Potential to emit 10 tpy or more for a single HAP or 25 tpy or more for combined HAP
  - All major sources of HAP are subject to Title V permitting

# Boiler Area Source NESHAP Rule 40 CFR Part 63 Subpart 6J

- Applies to an area source facility which emits or has potential to emit less than 10 tons per year (tpy) of any single HAP and less than 25 tpy of any combination of HAP.
- Rule applies to coal, biomass, and oil-fired boilers. **Rule does NOT apply to boilers that are gas-fired, as defined.**
- There is no de minimis size cut-off, but there are a lot of exemptions.

## Subpart 6J Exemptions

- Gas-fired boilers. A gas-fired boiler that periodically fires liquid fuels during periods of gas curtailment, gas supply interruption, startups, or for periodic testing (not to exceed 48 hours per year), is still considered a gas-fired boiler.
- Hot water heaters with a capacity of no more than 120 U.S. gallons or a hot water boiler with a heat input capacity of 1.6 million British thermal units per hour (MMBtu/hr) or less.

## Subpart 6J Exemptions (cont.)

- Residential boilers – providing hot water, heat or power for a residential unit of up to four families, or a single unit residence that has been converted or subdivided into apartments or condos.
  - A boiler serving a large dormitory or apartment building would not be considered a “residential boiler” under 6J, and would not meet this exemption.
- Temporary boilers; generally, if unit is at facility less than 12 months, it is considered a temporary boiler.
- Electric boilers.
- An electric utility steam generating unit (EGU) covered by subpart UUUUU of part 63 (i.e., the MATS rule).

## Subpart 6J Exemptions (cont.)

- Waste heat boilers, also known as heat recovery steam generators (these boilers recover traditionally unused energy and convert it to usable heat).
- Boilers that are used as control devices for Part 60, 61, 63, or 65 standards, where at least 50 percent of the average annual heat input to the boiler during any 3 consecutive years is provided by the other regulated gas streams.
- Research and development boilers.
- Boilers subject to other NESHAP standards, Section 129 standards, or hazardous waste boilers.

## 6J Subcategories

- What size is the boiler?
  - Less than 10 MMBtu/hr = “small”
  - Greater than/equal to 10 MMBtu/hr = “large”
- Is the boiler a new source or an existing source?
  - Constructed before June 4, 2010 = “existing”
  - Constructed on or after June 4, 2010 = “new”

## 6J Subcategories (cont.)

- What fuels are combusted in the boiler?
  - Coal subcategory
    - Any boiler that burns any solid fossil fuel and no more than 15 percent biomass on an annual heat input basis
  - Biomass subcategory
    - Any boiler that burns any biomass and is not in the coal subcategory
  - Oil subcategory
    - Any boiler that burns any liquid fuel and is not in biomass or coal subcategories. Gas-fired boilers that burn liquid fuel during periods of gas curtailment, gas supply interruption, startups, or periodic testing up to 48 hours per calendar year not included.

## 6J Subcategories (cont.)

- The following information may also affect the boiler's applicable requirements:
  - Does the boiler meet the "limited use" or "seasonal" boiler definitions?
    - Limited-use boiler: unit that burns any amount of solid or liquid fuels and has a federally enforceable average annual capacity factor of no more than 10 percent
    - Seasonal boiler: biomass- or oil-fired units that are shutdown for at least 7 consecutive months (or 210 consecutive days) each 12-month period due to seasonal conditions, except for periodic testing (not to exceed a combined total of 15 days during the shutdown)
  - Is the boiler equipped with an oxygen trim system that maintains optimum air-to-fuel ratio?

## 6J Requirements

- Refer to Handout: “6J Area Source Boiler NESHAP Summary”
  - Emission limits
    - The only “existing” (pre-6/4/10) boilers subject to emission limits are coal boilers  $\geq 10$  MMBtu/hr that are not “limited use” boilers
  - Energy assessments
    - A one-time energy assessment is required for “existing” (pre-6/4/10) boilers  $\geq 10$  MMBtu/hr that are not “limited use” boilers
  - Tune-ups
    - Tune-ups are required to be conducted every other year or every five years for most boilers subject to 6J

## 6J Emission Limits

- For units subject to emission limits, 6J includes requirements for:
  - Startup/shutdown procedures
  - Periodic stack testing
  - Site-specific testing, monitoring, and fuel monitoring plans
  - Operating limits for various control equipment
  - Lots of recordkeeping

## 6J Energy Assessments

- One-time assessment
- Conducted by *qualified energy assessor*
  - The qualified energy assessor may be a company employee or outside specialist
- Must be completed by March 21, 2014
- Energy assessments completed after January 1, 2008 that meet (or are amended to meet) requirements may be used in lieu of new assessment

## 6J Energy Assessments (cont.)

- The energy assessment must include the following 7 items:
  1. A visual inspection of the boiler system (e.g. cracks, corrosion, leaks, insulation);
  2. An evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating and maintenance procedures, and unusual operating constraints;
  3. An inventory of major systems consuming energy (i.e., energy use systems) from affected boiler(s) and which are under the control of the boiler owner or operator;

## 6J Energy Assessments (cont.)

4. A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage;
5. A list of major energy conservation measures that are within the facility's control;
6. A list of the energy savings potential of the energy conservation measures identified; and
7. A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

## 6J Energy Assessments (cont.)

- Energy assessment report is kept at facility – not required to be submitted to regulatory agency
- Facility decides which measures, if any, to implement
- Facilities operating under an energy management program compatible with ISO 50001 satisfy energy assessment requirement.
  - Program must include affected boiler, associated components, and applicable energy use systems.

## 6J Tune-up Requirements

- Inspect the burner, and clean or replace any components of the burner as necessary\*
- Inspect the flame pattern, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.
- Inspect the system controlling the air-to-fuel ratio, and ensure that it is correctly calibrated and functioning properly.\*

\*you may delay the inspection until the next scheduled unit shutdown, not to exceed: 36 months from previous inspection for sources requiring biennial tune-up; or 72 months from previous inspection for sources requiring 5 year tune-up

## 6J Tune-up Requirements (cont.)

- Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available, and with any nitrogen oxide requirement
- Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made
  - measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made

## 6J Tune-up Requirements (cont.)

- Maintain onsite and submit, if requested by the Administrator, biennial or five year report containing this information:
  - (i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler
  - (ii) A description of any tune-up corrective actions taken
  - (iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler, but only if the unit is physically and legally capable of burning more than one fuel

## 6J Tune-up Requirements (cont.)

- If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of startup
- You must conduct the tune-up while burning the fuel that provided the majority of the heat input to the boiler in the last 12 months before the tune-up (or both fuels if the boiler routinely burns two types of fuels at the same time)

## 6J Compliance Dates

- Existing Sources (commenced construction on or before June 4, 2010)
  - Complete initial tune-up and energy assessment, and comply with emission limit by March 21, 2014
  - If stack testing required, complete by September 17, 2014
- New Sources (commenced construction after June 4, 2010)
  - Must comply by May 20, 2011, or upon startup, whichever is later
  - If stack testing required, complete no later than 180 days after startup

## 6J Reporting Requirements

- Initial Notification
  - Due January 20, 2014 or within 120 days after source startup
  - Original due date for this notification was in 2011 (if it was submitted already, don't need to do another one)
  - Initial Notification is not required to be submitted electronically
- If stack testing required
  - Notification of Intent to Conduct Performance Test due at least 60 days before the performance stack test

## 6J Reporting Requirements (cont.)

- Notification of Compliance Status
  - Existing sources subject to tune-up or energy assessment: July 19, 2014
  - Existing sources subject to emission limits: July 19, 2014 or within 60 days after completing the performance stack test
  - New sources: Within 120 days after startup. If your source must conduct a performance stack test, the notification must be submitted within 60 days of test completion.
  - Notification of Compliance Status must be submitted electronically using EPA's Central Data Exchange (6J reporting function not yet available on this system)

## 6J Reporting Requirements (cont.)

- Compliance Certification Report
  - Prepare and sign by March 1 each year
  - Submit by March 15 if any deviations, or upon request
  - If no emission limits apply, report only needs to be completed for years during which a required tune-up was completed

# Boiler and Process Heater Major Source MACT

## Rule 40 CFR Part 63 Subpart 5D

- Applies to a major source facility which emits or has potential to emit 10 tons or more per year (tpy) of any single HAP or 25 tpy or more of any combination of HAP.
- Rule applies to coal, biomass, oil, and gas-fired boilers and process heaters.
- There is no de minimis size cut-off, but there are a lot of exemptions.

## Subpart 5D Exemptions

- An electric utility steam generating unit (EGU) covered by subpart UUUUU of part 63 (i.e., the MATS rule).
- Hot water heaters with a capacity of no more than 120 U.S. gallons or a hot water boiler with a heat input capacity of 1.6 million British thermal units per hour (MMBtu/hr) or less.
- Waste heat boilers, also known as heat recovery steam generators (these boilers recover traditionally unused energy and convert it to usable heat).

## Subpart 5D Exemptions (cont.)

- Boilers that are used as control devices for other NESHAP standards, where at least 50 percent of the heat input to the boiler is provided by the NESHAP regulated gas stream.
- Research and development boilers.
- Boilers subject to other NESHAP standards, Section 129 standards, or hazardous waste boilers.
- A recovery boiler or furnace covered by subpart MM.

## Subpart 5D Exemptions (cont.)

- Residential boilers – providing hot water, heat or power for a residential unit of up to four families, or a single unit residence that has been converted or subdivided into apartments or condos.
  - A boiler serving a large dormitory or apartment building would not be considered a “residential boiler” under 5D, and would not meet this exemption.
  - Due to an editorial error, this exemption is not in the currently published version of 5D.
- Temporary boilers; generally, if unit is at facility less than 12 months, it is considered a temporary boiler.

# 5D Subcategories

- What size is the boiler?
  - Less than 10 MMBtu/hr = “small”
  - Greater than/equal to 10 MMBtu/hr = “large”
- Is the boiler a new source or an existing source?
  - Constructed before June 4, 2010 = “existing”
  - Constructed on or after June 4, 2010 = “new”

## 5D Subcategories (cont.)

- What fuels are combusted in the boiler?
  - Coal subcategory
    - Any boiler or process heater that burns at least 10 percent solid fossil fuel and no more than 10 percent biomass on an annual heat input basis
  - Biomass subcategory
    - Any boiler or process heater that burns at least 10 percent biomass on an annual heat input basis
  - Oil subcategory
    - Any boiler that burns any liquid fuel, no more than 10 percent solid fossil fuels, and no more than 10 percent biomass on an annual heat input basis.

## 5D Subcategories (cont.)

- What fuels are combusted in the boiler?
  - Gas 1 subcategory
    - Any boiler or process heater that burns only natural gas, refinery gas, or other gas 1 fuels with the exception of liquid fuels burned during gas curtailments and supply emergencies or for periodic testing (not to exceed 48 hours in a calendar year).
  - Gas 2 subcategory
    - Any boiler or process heater that is not in the Gas 1 subcategory and burns any gaseous fuels in combination with less than 10 percent solid fossil fuel, less than 10 percent biomass, and less than 10 percent liquid fuel on an annual heat input basis.

## 5D Subcategories (cont.)

- The following information may also affect the boiler's applicable requirements:
  - Does the boiler meet the "limited use" boiler definition?
    - Limited-use boiler: unit that burns any amount of solid or liquid fuels and has a federally enforceable average annual capacity factor of no more than 10 percent
  - Is the boiler equipped with an oxygen trim system that maintains optimum air-to-fuel ratio?
  - For solid fuel-fired boilers, what is boiler design type (pulverized coal, fluidized bed, stoker, etc.)?
  - For liquid fuel-fired boilers, is fuel a light liquid or heavy liquid?

# 5D Requirements

- Refer to Handout: “5D Major Source Boiler MACT Summary”
  - Emission limits
    - “Existing” (pre-6/4/10) boilers and process heaters subject to emission limits include coal, biomass, oil, and gas 2 units  $\geq 10$  MMBtu/hr that are not “limited use” units
  - Energy assessments
    - A one-time energy assessment is required for all “existing” (pre-6/4/10) boilers and process heaters that are not “limited use” units
  - Tune-ups
    - Tune-ups are required to be conducted every year, every other year, or every five years for all boilers and process heaters subject to 5D

## 5D Requirements (cont.)

- For units subject to emission limits, 5D includes requirements for:
  - Startup/shutdown procedures
  - Periodic stack testing
  - Site-specific testing, monitoring, and fuel monitoring plans
  - Operating limits for various control equipment
  - Lots of recordkeeping
- Information on how to conduct a tune-up or energy assessment is the same as for 6J

## 5D Compliance Dates

- Existing Sources (commenced construction on or before June 4, 2010)
  - Complete initial tune-up and energy assessment, and comply with emission limit by January 31, 2016
  - If stack testing required, complete by July 29, 2016
- New Sources (commenced construction after June 4, 2010)
  - Must comply by January 31, 2013, or upon startup, whichever is later
  - If stack testing required, complete by July 30, 2013, or 180 days after startup, whichever is later

# 5D Reporting Requirements

- Initial Notification
  - Existing units: Due May 31, 2013
  - New units: due January 31, 2013 or within 15 days after startup, whichever is later
  - Initial Notification is not required to be submitted electronically
- If stack testing required
  - Notification of Intent to Conduct Performance Test due at least 60 days before the performance stack test

## 5D Reporting Requirements (cont.)

- Notification of Compliance Status
  - Existing sources subject to tune-up or energy assessment: March 31, 2016
  - Existing sources subject to emission limits: within 60 days after completing the performance stack test
  - New sources: Within 60 days after startup. If your source must conduct a performance stack test, the notification must be submitted within 60 days of test completion.
  - Stack test reports must be submitted electronically using EPA's Central Data Exchange
  - Electronic reporting is not required for other notifications of compliance status

## 5D Reporting Requirements (cont.)

- Compliance Certification Report
  - For boilers and process heaters subject to emission limits, submit by July 31 and January 31 of each year, a semiannual Compliance Certification Report for the previous 6-month period
  - For boilers and process heater subject only to an annual, biennial, or every five year tune-up requirement, reports only need to be submitted annually, biennially, or every five years
  - These reports must be submitted electronically using EPA's Central Data Exchange

# DNR's Delegation Status for 6J and 5D

- DNR has not yet adopted either of these rules
- Until DNR adopts the rules, all notifications and reports are required to be submitted to EPA
  - DNR would appreciate a courtesy copy of these reports
- DNR is not making formal applicability determinations or evaluating compliance

# Contact Information

- EPA Region 7 Boiler NESHAP and MACT Contact:
  - Lisa Hanlon [lisa.hanlon@epa.gov](mailto:lisa.hanlon@epa.gov); (913) 551-7599
- Iowa DNR Boiler NESHAP and MACT Contact:
  - Diane Brockshus [diane.brockshus@dnr.iowa.gov](mailto:diane.brockshus@dnr.iowa.gov); (515) 725-9514
- EPA websites for boiler rules:
  - Most of the 6J resources are available at <http://www.epa.gov/boilercompliance/>
  - A few of the 5D resources are only available on <http://www.epa.gov/ttn/atw/boiler/boilerpg.html>
- Iowa DNR NESHAP Website:
  - <http://www.iowadnr.gov/InsideDNR/RegulatoryAir/AirToxics-NESHAP.aspx>
  - Not many tools available yet for boiler rules
- Mailing addresses for NESHAP notifications
  - Director, Air and Waste Management Division, U.S. Environmental Protection Agency, 11201 Renner Blvd., Lenexa, KS 66219
  - NESHAP Coordinator, Iowa Department of Natural Resources, 7900 Hickman, Suite 1; Windsor Heights, IA, 50324